

RADIOGRAPHIC TOMOSYNTHESIS IMAGE ACQUISITION UTILIZING
ASYMMETRIC GEOMETRY

ABSTRACT

[0045] Systems and methods that utilize asymmetric geometry to acquire radiographic tomosynthesis images are described. Embodiments comprise tomosynthesis systems and methods for creating a reconstructed image of an object from a plurality of two-dimensional x-ray projection images. These systems comprise: an x-ray detector; and an x-ray source capable of emitting x-rays directed at the x-ray detector; wherein the tomosynthesis system utilizes asymmetric image acquisition geometry, where $\theta_1 \neq \theta_0$, during image acquisition, wherein θ_1 is a sweep angle on one side of a center line of the x-ray detector, and θ_0 is a sweep angle on an opposite side of the center line of the x-ray detector, and wherein the total sweep angle, φ_{asym} , is $\varphi_{asym} = \theta_1 + \theta_0$. Reconstruction algorithms may be utilized to produce reconstructed images of the object from the plurality of two-dimensional x-ray projection images.